- Introduction, Logistics, Mark and Re-capture Estimation.
- Brief Pseudo Randomness, Universal Hashing, Chaining, and Linear Probing.
- Compressed Cache and Bloom Filters. (Why caching does not kill your memory)
- Markov, Chebyshev's, and Chernoff Bounds.
- Analysis of Hashing, Chaining and Probing.
- Resizing Hash Tables: Consistent Hashing and balanced allocations.(The idea behind Akamai Technologies)
- SPOCA: A Stateless, Proportional, Optimally-Consistent Addressing Algorithm. (Best paper in USENIX 2011)
- Introduction to Stream Computing and Reservoir Sampling. (Algorithms at the Edges)
- Stream Estimation 1: Count-Min Sketch (Generalized Bloom Filters)
- Stream Estimation 2: Count-Sketches
- Stream Estimation 3: Count Distinct and Norm Estimation on Streams.
- Minwise Hashing, Near-Duplicate Detection and LSH 1. (What is "hash function" in this NY-Times article)
- Minwise Hashing, Near-Duplicate Detection and LSH 2.
- Basic Sampling. (Beyond Random Sampling)
- More LSH (Eliminate Pairwise Comparisons)
- Advanced Sampling. LSH as Computationally Efficient Importance Samplers. (Adaptive Sampling at the Cost of Random Sampling)
- DNF Counting(A closer Look at Estimation via Sampling).
- Markov Chains, Stationary distributions, MCMC 1 (Sampling in Complex Spaces)
- Markov Chains, Stationary distributions, MCMC 2.
- Markov Chains, Stationary distributions, MCMC 3.
- Markov Chains, Stationary distributions, MCMC 4.
- Randomized Routing
- Estimation on Graphs
- ACE and RACE Density Estimation (Analytics over Edge)